



GigaPico Next AutoFocus

Users' Manual 1.1

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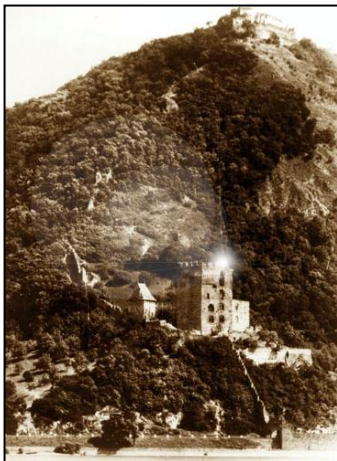
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1 Introduction

1.1 What is FSO?

FSO is free space optics provides point-point broadband communications using Laser Light as the transmission medium.

FSO is a state of art data communication method which is based on a very old communication solution. Ancient Chinese developed a protection system against the Mongol tribes, building watchtowers within the line of site to other towers. And as soon as the towers saw some hostile sign on the horizon they use they shield to reflect the sun to the remote towers. In this way the area could be prepared against the attack in a very short period of time.



In the ancient times for this communication use the mirror as a transmitter and the sunlight was the light source, and the receiver was the remote guard's eye. This basic signalling method was developed later into up communication device which used „line coding”. This allowed the guards to tell the number of enemy, or the direction they are coming from.

Current **FSO** systems use a laser-diode as a light source, and a receptor diode (photo diode) to receive the signals coming from the laser diode from the transmitter side. But the basic elements are still the same: line of site between the communication nodes, and individual line coding. It is all about performance. **GeoDesy FSO** offers **FSO** systems with the highest power budget available on the market.

1.2 Why is it important?

Because of in the ancient Chinese times, the rain, the fog, or even the cloudy weather, could impact the operation of the whole system.

In the **FSO** units, comprising light source and receiver the cloud problem was solved, but development conditions still can impair performance. To go throw the rain, the fog, or snow you need more and more power to be seen from the remote side. Achievable power levels are limited by a number of factors including eye safety.

In this way there is no other choice to see more than „training the eye”. Making the receiver more and more



sensitive to sense delight emitted from the remote side. **GeoDesy FSO** offers high transmit power and also very hard receiver sensitivity. These two factors combined to provide one of the best performing **FSO** systems on the market today.

To meet the demands for every higher bandwidth, **GeoDesy FSO (Europe) Limited** continues to invest heavily in research and development with the newest product line which offers Gigabit speeds being launched.

This manual describes the **GeoDesy FSO Next** series of free space laser transmission system.

The **GeoDesy FSO Next** product range offers cost effective reliable free space laser transmission for two Mbps up to 1000 Mbps data to the air, where a clean line of site is available. It delivers the most effective point-to-point connection between computer networks or telephone exchanges.

No need for installing cables, no rental costs, no licensing requirements.

Ideal for urban areas or city centres, where the use of these lines are expensive. Suitable for factories or industrial environments where high noise level can interfere with the transmitted data. The best choice to make a connection across rivers and other natural or artificial obstacles, where cable is not available.

The transmission technique used in the **GeoDesy FSO** devices provides transparent and wire-speed data transfer with virtually zero latency. Because they use infrared light as the transmission medium, **GeoDesy FSO** system do not require frequency licenses and the transmission is not effected by electro-magnetic or radio-frequency interference. Basically the **GeoDesy FSO** link can be considered as a virtual fibre in the air, which ends in real fibre optic cable at both ends.

Our product is built using high quality components for operation in even the most adverse conditions.

Metal housing gives robust, waterproof environment for the electronics.

The shield protects the device from direct sunlight and provides extra air isolation.

The **GeoDesy FSO X** systems comprise two laser-heads one at each end. The interface connections are housed in the outdoor unit together with the PSU of the system.

Best practises were employed in cost engineering throughout the development of **GeoDesy FSO**.

1.3 Optical Free-space Transmission

The principle used in free space laser transmission is very similar to the one is used for fibre optic transmission. The difference is while fibre optic devices use electronics and optics optimized for transmission to the air. Also one can observe to the similarity in the transmission properties. No galvanic contact, no ground-loops, no need for surge protection, noise immunity, long distances, high bandwidth.

What makes it unique – and difficult to design – is that it does not require any transmission medium like fibre or copper, but it has to cope with the dynamically changing parameters. For instance while the attenuation of an optical fibre is constant, the attenuation of the atmosphere between the laser units can change dramatically (depending on the weather conditions).

The laser-heads are usually placed on top of building, where the clean line of site is guaranteed and the beam cannot be interrupted.

In the head the incoming signal is amplified, encoded, and then drives the laser-diode. The transmitter optics assures the proper beam shape and controls the beam divergence. The receive optics perceives and directs the transmitter signal to the photo diode. The diode converts it back into electrical, than it is decoded, amplified and converted.

There are several things that can influence the quality of transmission. We can classify those factors into three main groups.

System conditions - transmitting power, transmitter's wavelength, beam divergence, receiver optics diameter, receiver sensitivity, parameters of optical system and casing. These parameters determine the system's characteristic at a certain distance and are controlled by system design and factory set up.

Weather conditions - molecular absorption, particle scattering and turbulence. These elements have great effect on the operational conditions of the system. We do not have very much influence on them; proper product selection can eliminate the undesirable effects.

Environmental conditions - building movements, direct sunlight, refractive surfaces. These are also key factors related to the installation sites and can be controlled by appropriate site survey and system installation

1.4 Typical applications

Most typically the **GeoDesy FSO Next** product are is used to interconnect LAN-s. The system is protocol transparent, thus other applications also can be taken into consideration. Appropriate interface converters are needed and system bandwidth must be matched for that.

Here we collected some circumstances, where the deployment of the **GeoDesy FSO** is the most adequate as a cost effective solution.

Those are:

Areas with natural or artificial obstacles



Where cable is actually not an alternative, like across rivers or railways or in rugged terrain.

Urban areas

Where only leased lines are available with limited speed, and high rental cost. With GeoDesy FSO links you can establish on line LAN-to-LAN connections.



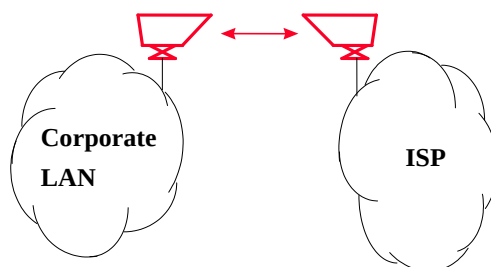
Industrial areas



Where you have noisy environment with high EMI or RFI. Factory buildings, airport objects can be connected through laser link.

ISP connections

Where high bandwidth is required. ISP's can offer high-speed links to their customers or trunks can be established between ISP's instead of expensive leased lines.



2 Interfaces for the Giga Next AF Series

2.1 1000Mbps TP interface

The **GeoDesy FSO Giga Next AF** series products are designed to provide easy-to-use and cost-effective solution for interconnecting Local Area Networks. By utilizing standard Category 5e cable and using standard IEEE802.3af interface the deployment of the system is easier than ever before. The transparent and wire speed data transfer together with virtually zero latency assures the easy integration of the system in all environments.

The **Giga Next AF** systems should be considered as repeaters in the network. So the installation distance between the head and the network device is 100m. The distance on a back to back site is maximum 5 meters, between the heads without signal regeneration.

The **Giga Next AF** systems connecting to the network with two RJ 45 cable which provides the power required for operation and the data. The system requires IEEE 802.3af Power over Ethernet switch or power injector. The power consumption suits to the standards described in the standard. Also provides fast and easy connection for the management system for more details please see the chapters below. The system is certified **Class 1M product**, this way 100% eye safe.

2.2 1000 Mbps FO interface

The GeoDesy FSO **Giga Next MF** system is ready to be upgraded with a Single or Multi mode SC fiber interface with SX or LX option.

The power is provided via the same cable as in the case of the TP interface systems.

3 Sites of installation

3.1 Key factors of operation

There are four key issues that the site survey has to shed light on. Proper system operation cannot be guaranteed without satisfying all of the four requirements.

Clear line of sight - The entire optical path between the two ends must be free of any obstacles. It not only means that one has to see the other side, but other possible sources of disturbance should also be taken into consideration. For example there might be turbulence above the roofs and other constructions, and this can cause fraction or scattering of the beam or snow accumulation on roofs too close to the beam can influence or even interrupt communication.

Solid mount surface - is the key for long-term operation. Since the diameter of the beam is limited, it is extremely important to mount the unit on a stable structure with the possible smallest movement. This way the receiver of the remote unit cannot get out of the beam due to the movement of the opposite head.

East-West orientation - although the receiver optics are equipped with optical filters to protect the receiver diode from the effect of undesired light sources, direct sunshine can cause saturation of the diode. This prevents the system from working properly for several minutes a day at certain times of the year. In most cases this effect can be avoided by careful selection of the mounting spot.

In order to comply with the requirements of the successful installation - including the discussed four key factors and other criteria - the following matters should be taken into consideration.

3.2 Preferred installation sites

All buildings and constructions have a certain movement of their own. It's determined by the structure and material of the building. Metal structures can shift or twist due to temperature changes. Wooden construction can expand or shrink with any changes in humidity. Give preference to concrete or brick buildings. On the other hand high structures like towers, skyscrapers or poles are always subject to movement. Mount the support frame to walls of the building or near corners, as they are the most stable spots. Use appropriate consoles for wall mounting. If a stand is used on the top of

building, secure it directly to the ceiling or to the concrete cornice wherever is possible. Do not fix stands to insulating materials as they can slowly sink under the weight of the unit and with temperature changes. Big chimneys and smokestacks may look stable, but as their inner temperature varies they can also move. Vibration caused by heavy traffic, trains and elevators etc. may slowly move the system out of

its specified direction. Another important consideration is to provide enough space for alignment and to have the potential for future maintenance. Consider that the support frame is usually heavy, so the selected spot should be easily accessible.

<i>Preferred installation sites</i>	<i>Pay attention to</i>	<i>Avoid (*)</i>
Concrete wall	Behind window	Soft materials
Brick wall	Old constructs	Chimneys
	Microwave towers	Wooden constructs
		Metal masts or Frames
		Hidden heat isolations, like Styrofoam

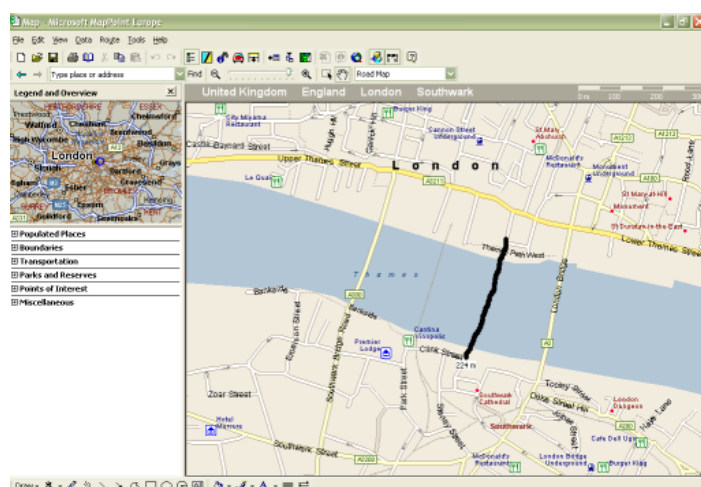
(*)

In cases where installations are listed under "AVOID" cannot be avoided than special mounting accessories to be designed and special installations must be used.

It is not only the building that has to be solid, but the support structure too. Antenna poles and security camera holders are not suitable for the **GeoDesy FSO** units.

3.3 Distance measurement

Because the units were designed, and calibrated for certain distance operations the higher distance will decrease the availability. GeoDesy FSO pre-calibrates and pre-tests every unit shipped to the customer. To ensure that the unit you are about to



buy fits to the needs, the first step is to measure the distance. The best way to measure it is by GPS (Global Positioning System), these units are accurate enough to determine the distance between two points. For more details please refer to the GPS manufacturer

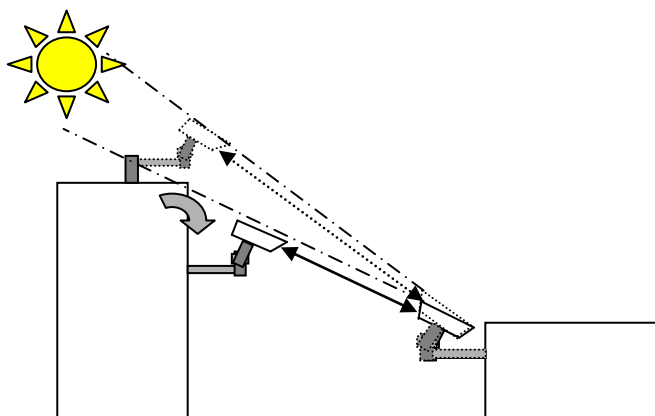


handbook. Also there are several other ways to measure the distance. If you know the exact

address you can use mapping software like MapPoint or Auto route.

3.4 Direct sunshine

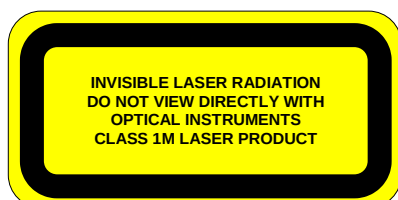
To prevent the sun shining directly into the receiver optics, first one has to determine the orientation of the link. Try to avoid East-West orientation wherever it is possible. Examine both sides of the link at sunset and sunrise and find a position where the sun cannot get behind any of the heads. Be aware that the path of the sun is changing throughout the year.



4 Eye safety

There are no two installation spots of the same kind, the buildings or structures, the available space and the accessibility of the place will be different in each case. Nevertheless, as a general rule it is very important to select the installation site so that nobody can look directly into the transmitter. For this reason place the head either so high (on the side wall of the building) or so close to the edge of the building (on a parapet on the rooftop) that no person can approach it accidentally and can get into the beam path. Set up barriers if necessary and put warning signs at prominent places.

The laser heads are provided with all labels and hazard warnings required by the laser standard. There are warning labels on both the left and right side of the protective cover next to the optical window and there is a warning and an informative label on the rear side of the laser head.



 	
Type	: LB P0500E1000TP
S/N	: LBH-«s/n»
Input Power	: -48VDC IEEE 802.3af compliant
Laser	: 1M
Wavelength	: 785nm
Manufactured by: GeoDesy FSO 1162 Budapest, Kondorfa u. 6-8, HUNGARY, Tel.:+36-1-453-7440 Fax.:+36-1-240-3570 www.GeoDesyFSO.com	

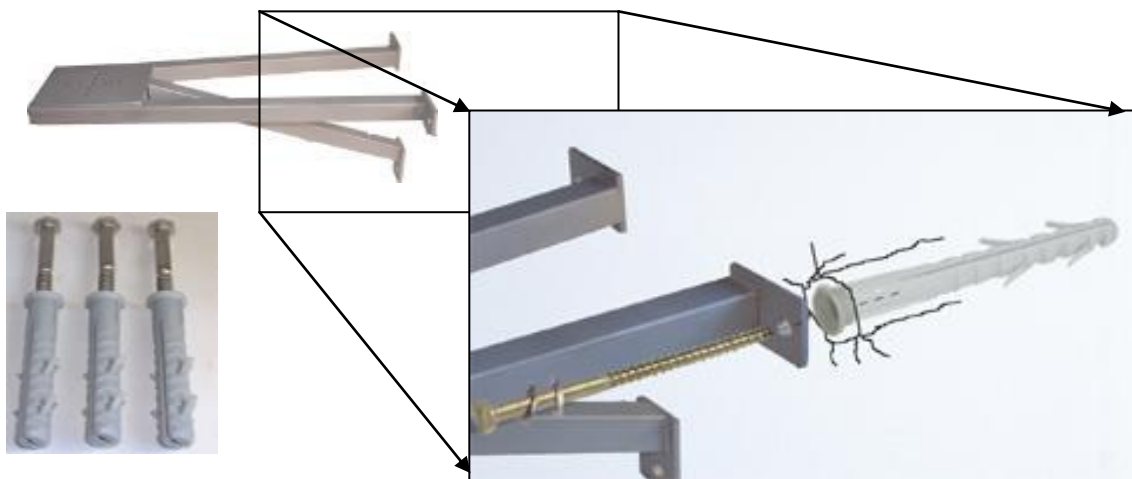
5 The mounting bracket

In the following chapter you will find detailed description of the bracket fastenings.

5.1 Mounting brackets for the X Series

GeoDesy FSO provides the mounting bracket and all the necessary components for **X** series units. A simple fixing technique of this bracket can be seen on the following figure, required tools are as follows:

- drilling machine
- 10 mm wrench



Bracket sizes:

Length:	463mm
Leg Width:	263mm
Head Width:	130mm
Drill size:	10mm wall drilling

Installation steps:

- Place the bracket on the wall
- Mark the wall with a permanent marker
- Use your 10mm wall drill to drill all of the holes into the wall
- Clean the holes
- Place the wall-plugs into the holes (please note that some times you need to use hammer to put the wall-plugs into the hole, if you have to please be careful not to break the wall-plug)
- Place the bracket to the wall and line it up to the holes
- Put the screws into the wall-plug through the hole on the leg of the bracket (please see the figure above)
- Tighten up the screws

Packet list for the bracket:

3pcs 8x110 screw for bracket fixing

3pcs 8x100 plastic wall-plug for bracket fixing

2pcs M6x90 bolt Head fixing

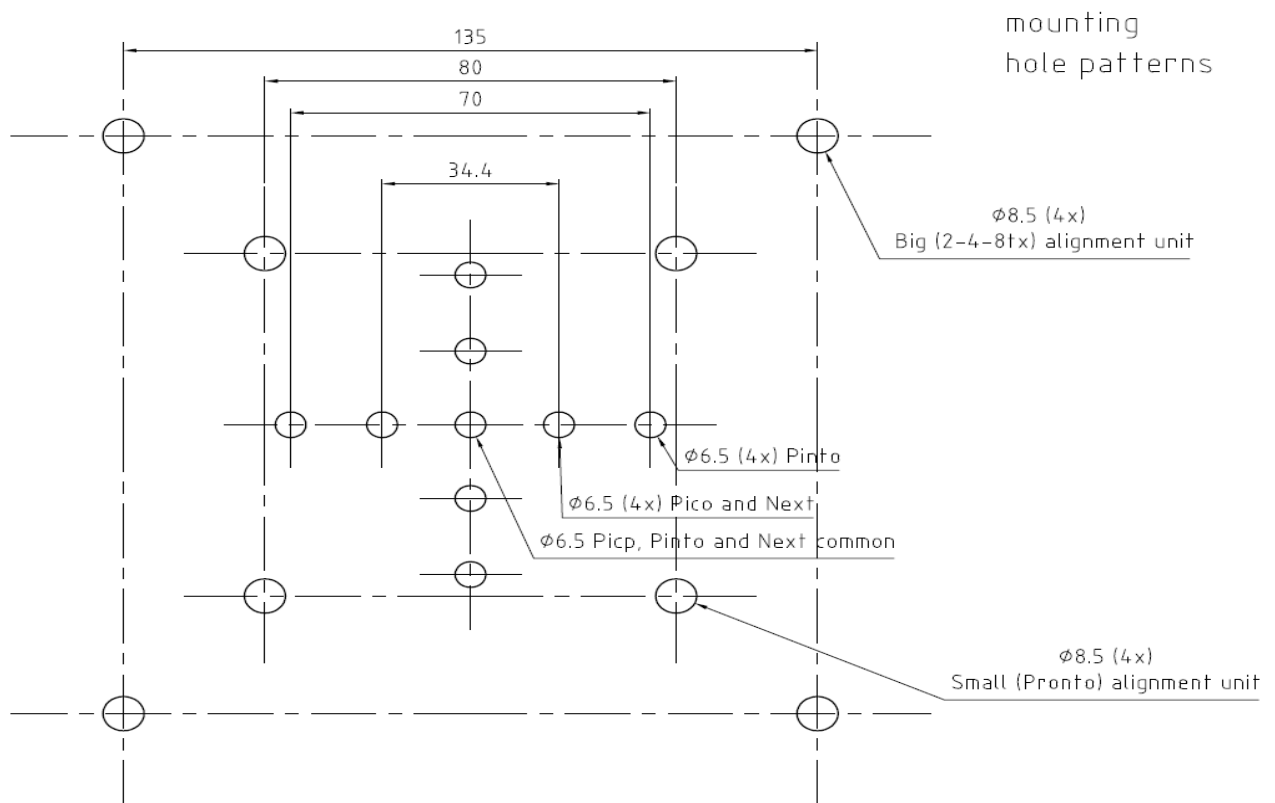
3pcs M6x25 screw Head fixing

3pcs M6 bolt head fixing

6pcs 6mm spacer bracket and head fixing

6pcs 6mm spring spacer bracket and head fixing

Mounting Hole Patterns



6 System installation

6.1 On the table test

Warning! Do not look either into the transmitter or the receiver optics because at this distance even the reflected laser beam *can* be dangerous to your eyes. Operating the system on much shorter distance than presumed originally can cause saturation or even permanent damage to the receiver. Always use optical attenuators for this kind of test.

The on-the-table test needs careful planning and careful use during the test period. The units should be placed at about 2 m distance from each other with optical windows facing one another. Put an appropriate optical attenuator (Attenuating foil or cardboard with several small holes) between the heads. Make all the necessary connection as described below to connect your network equipment (computer or protocol analyzer) to the heads and power up the units. Turn ON the PoE injector and check if the power LED is ON on the head.

You should be able to align the units without any tool and get full received level on the signal strength LED's. Make sure that the "Saturation"(OV) indicator is OFF. Adjust your attenuators if necessary to avoid saturation of the receivers.

Please note that at this short distance, specially the longer distance links can reflect to the remote site or even to the same head. If you experience full receiving level, with no traffic throughput, in that case try to move the heads slightly units out of the reflection zone.



Please also take in consideration that the laser beam is concentrated and in such a short distance can harm your eyes, every time you test the units on short distance, do it with extra care. Never look into the sighting device if the remote laser is turned on. We strongly suggest to double check the power connection before you turn on the device. Handle the power connection with extra care. Safety first.

After obtaining the desired received level, check the data connection between devices. Using computers or appropriate testing devices.

On the table tests are perfect for troubleshooting (If there is a transmission problem, check the status of the connecting devices (e.g. Link signal or cable polarity) and cables.) in a controlled area. If you experience some problems during the test, please try to test the connected equipments with a direct connection.

6.1.1 Alignment of the PX0500E1000TP

The first step after the unit was placed to the bracket, and the units facing each other.

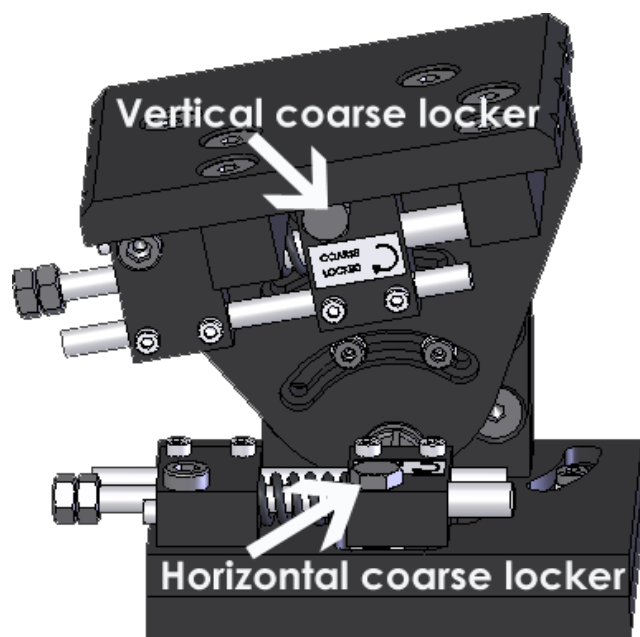
On the back of the receiver you can find the LEDs and LCD screen for the local received level and the remote received level.



This help will be very useful because as soon as you have received – which is very easy to achieve – you can see the effect of your local sides movement to the other side. For further information please check the *Meanings of the LCDs* chapter.

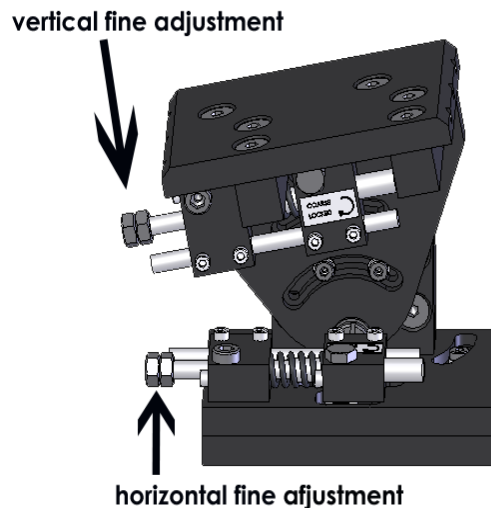
6.1.2 How to use the alignment base

1. Loose the Coarse locker on the horizontal as well as on the vertical side with a 10mm spanner
2. Move the head left - right up down you should use the built in telescope to lit up a few LEDs on the remote end.
3. When you have lined the unit up to a rough position lock the coarse locker with a 10mm spanner.
4. Repeat step 1-4 on the remote end.
5. On the bottom of the unit you can find fine tuning screws one for horizontal and one for vertical.
6. No tightening is needed on any other screw than the coarse locker.



6.1.3 Fine tuning

1. Site A start moving the laserhead with the horizontal fine adjustment screw by looking at the Remote end received level
2. Using the fine adjustment screws, lighten as many LEDs as possible
3. Repeat step 1-2 on Site B.
4. If necessary try step 1-2 on both sites again.



6.2 Meanings of the LCD

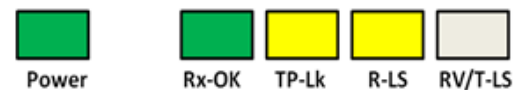
Power: The head is powered up.

RX-OK: Received beam is good for communication.

TP Lk: Copper link between the head and the Network equipment.

R-LS: The received signal from the remote end is modulated and .

RV/TLS: Remote end is visible for the management system and there is TP connected to remote end – same as TP-Lk but displays it on the remote end.



Please press the button and look at the LCD screen!

1.screen

Loc (local level): Local Received level

Rem (remote level): Remote Sites Received level

Op-optimal

Ov-overload

REM:?FSO Currently on FSO channel searching the Remote side.

REM:?Backup Currently on Backup channel searching the Remote side.

REM:?FSO or Backup Auto Software decides on what to search for.

2.screen

HeadSN: Laser head serial number.

0000001

IP address: default IP address: **192.168.100.220** or **192.168.100.221**

After factory reset the IP address is always: 192.168.100.221

3.screen

Temperature

4.screen

-AF mode position manual 000

-AF mode auto

Here shows that the auto focus with is enabled or disabled.

5.screen

tech@geodesy.hu

6.3 AF adjusment method

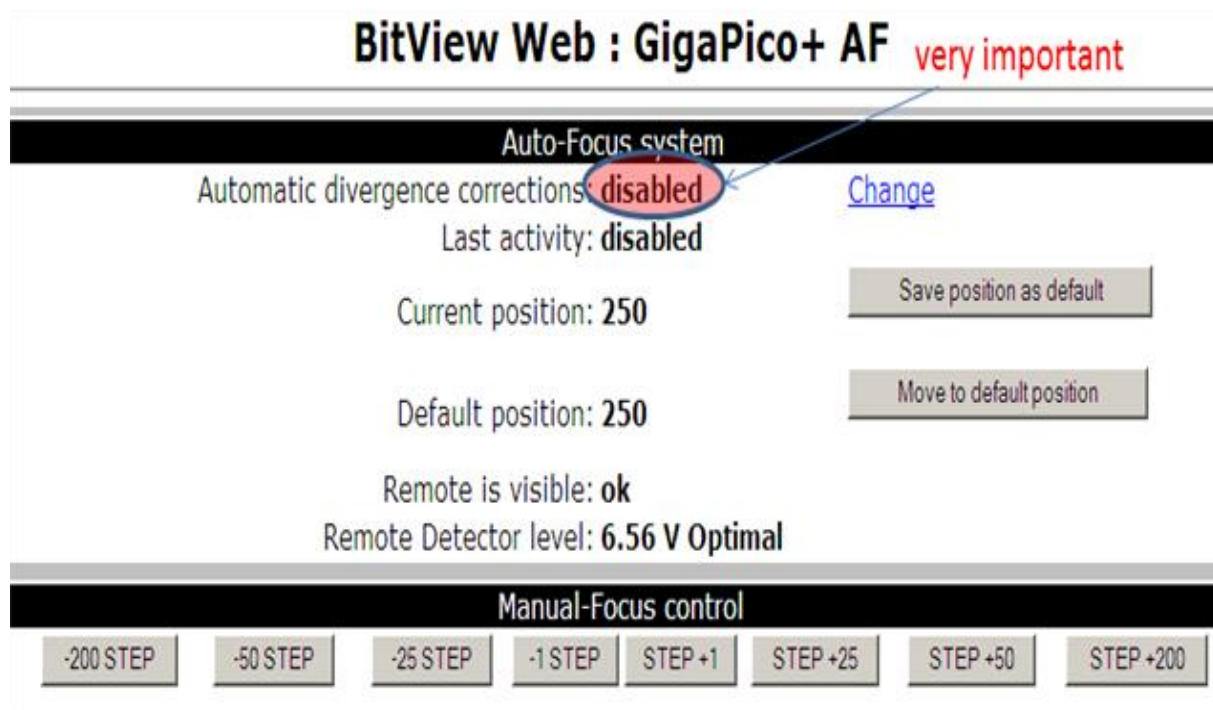
What is AF after all? AF stands for Auto Focus. **Geodesy FSO Giga Next AF** is equipped with the latest innovation from Geodesy. An automatic focusing control system. The system is capable of changing its beam divergency depending on the changes of the environment. In the case if the weather gets bad, the system will decrease the beam size, to concentrate the distributed beam power, to ensure more stable operation.

IMPORTANT! Auto focus adjustment does not work if there is no remote level! Remote connection required for the Auto focus adjustment.

The installation of the **Giga Next AF** is pretty much the same as the standard system installation. To make sure that the AF system won't kick in during the alignment, ensure that the AF is set to disabled, which is the factory default.

The default settings of the Auto Focus (AF) laser heads is manual mode (disabled). The factory beam divergence is set for 200m, this way the alignment of the system will be easy on every installation distance.

Please do not change the setting of the AF laser heads to auto focus when there is no connection between the two heads.

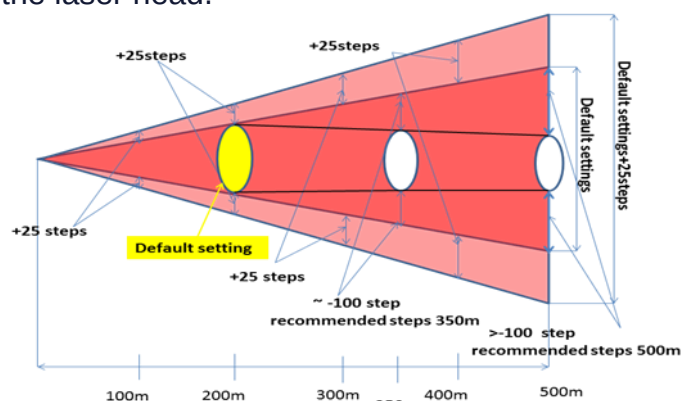


Alignment steps

1. using the crosshair align the units into a roughly aligned position. Please note that the alignment scope will not be able to provide with a perfect alignment, this will have to be done using the fine alignment screws referring to the received level screen on the LCD panel.
2. using the fine adjustment screws on the alignment base set the units to the highest received level possible. (for further details on how to perform the fine adjustment refer to 6.2.2 and 6.2.3 chapters)

Default distance setting of all **Giga Next AF** laser heads for 200m. As you can see in below sketch, “+25 STEP” equals ~ 2 cm larger laser beam over 100 meters.

For example, if you would like to install the laser heads over 350 meters than you will need smaller beam size to reach bigger distance (compared to the default 200m), so click on “-100 STEP” which will make the laser beam narrower and will be proper for 350m. While clicking on the “STEP” buttons please check the remote received level on the laser head.



Please perform the same operation on the other side.

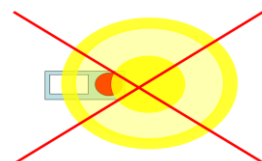
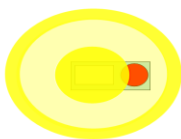
3. After we have got the proper level, please click on “Save position as default” button. As you have clicked on the “Save position as default” button the laser heads will enable the AUTO FOCUS mode (enabled). The equipment will automatically improve the remote level to the most ideal position.

Note: Geodesy FSO shall not be responsible for any failures from improper handling of the device. If any other screw than the coarse lockers or the fine adjustment is moved, might decrease the stability of the installation.

Trick for the reliable alignment

Please note that the beam has a powerfull ring on the side of the head and easily can be set to this ring but this is far not as big as the core part of the beam. So every time you have an alignment please make sure that when you see the maximum LED s or a relatively high received level. Keep on moving to determine where the core part of the beam is. This can be done easily by looking at the received level you will see that the received level moves up then it will start move down than up again. During this time you just had the head moving into one direction. If you have any doubt on how to do the alignment please contact your distributor

for further help. Or contact GeoDesy FSO technical support.



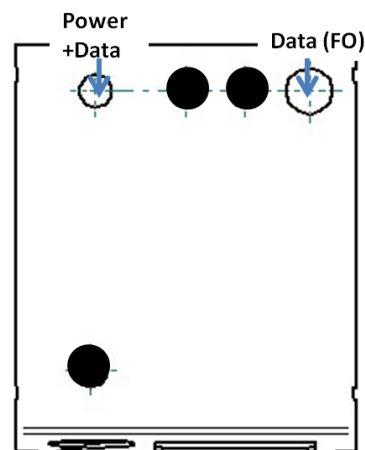
6.4 Connecting to your Network

6.4.1 PoE 802.3 af connection.



1. Orange/White
2. Orange
3. Green/White
4. Blue
5. Blue/White
6. Green
7. Brown/White

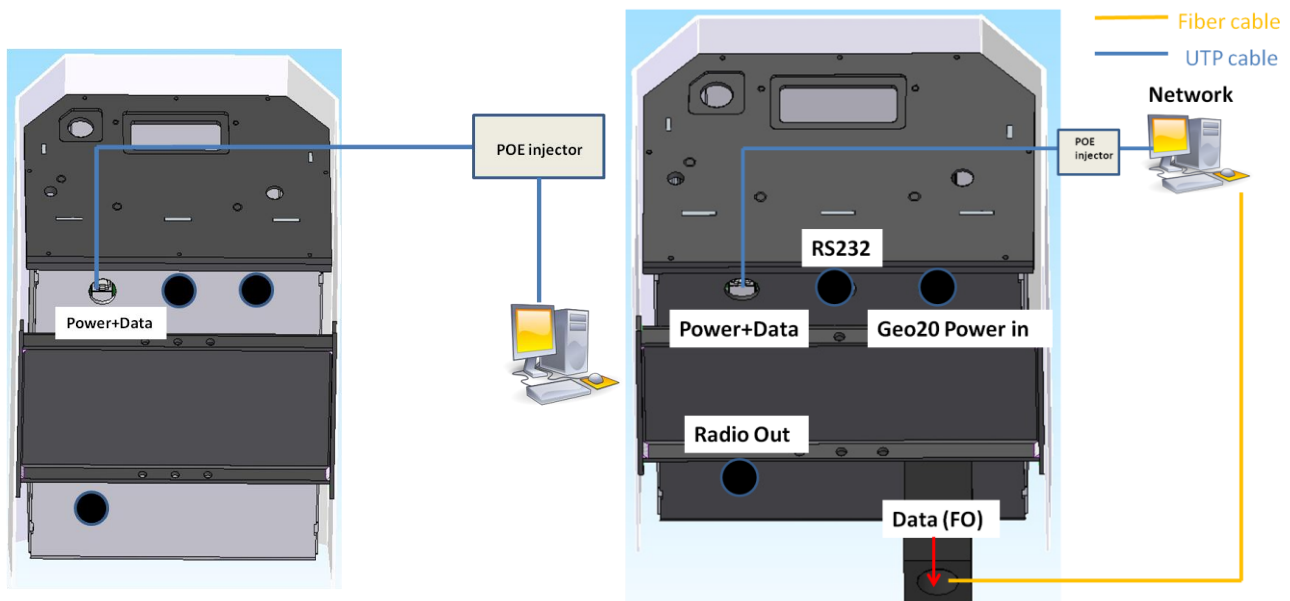
TX+
TX-
RX+
RX-
+VIN
-VIN



BOX1.1(FO)

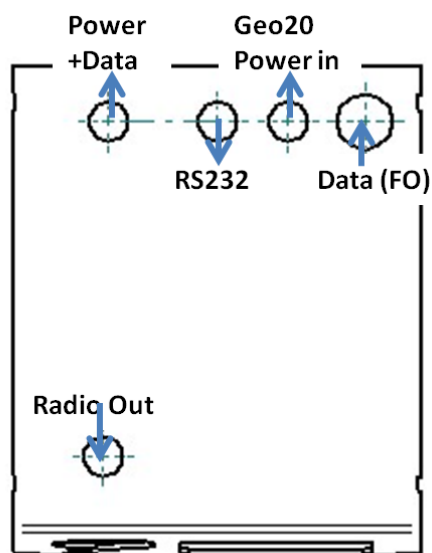
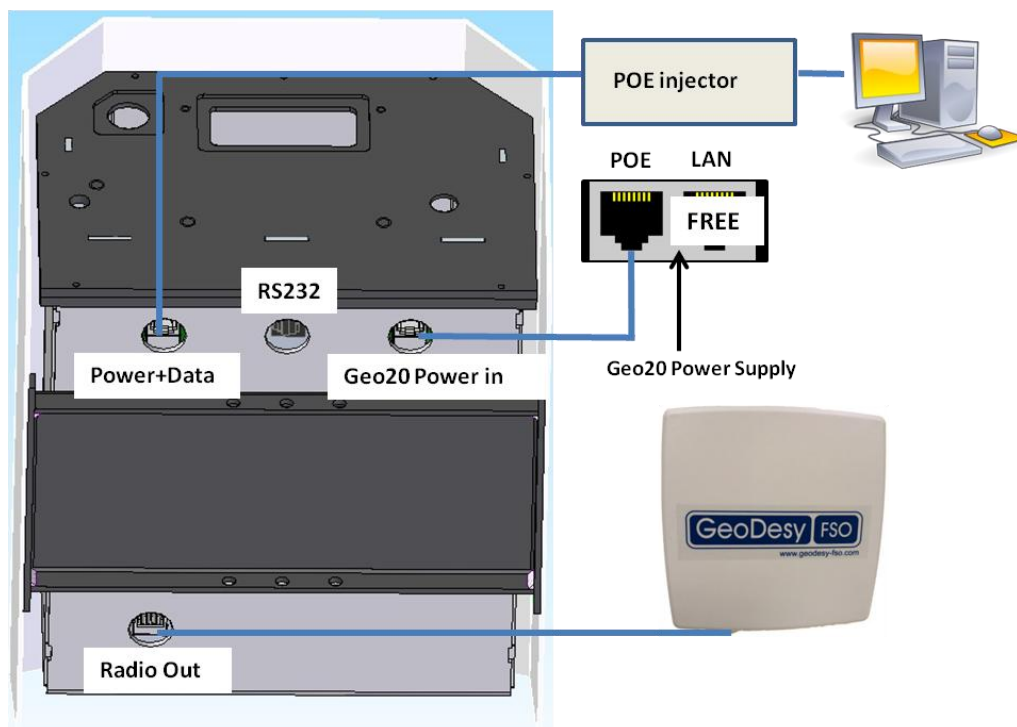
6.4.2 System layout

BOX1.0(FO)



6.4.3 System layout with GEO20

Beside the GeoDesy laser equipment (buckup) you can only use GeoDesy's GEO20 Radio equipment. In the case of using a different backup solution, could cause undesired operation. Please refer to support@geodesy-fso.com for more information about the compatibility.



BOX 1.0(FO)

7 Management

7.1 Features

The **Inband** network-monitoring unit is a newly developed highly featured monitoring for GeoDesy FSO manufactured laser links. This high quality equipment allows the user to monitor the link statuses such as detector voltage transmitter status, and many other features of the Laser link. Nevertheless, this chapter is intended to describe the usage of this network monitoring, and its connection and relationship with the GeoDesy FSO laserheads.

Login Screen and password

The GeoDesy FSO unit arrives with preset values. Such as user name and password. We strongly recommend you to change the password after the unit was installed. The default **username** is **admin**, and the **password** is **admin**. If you forget your password contact technical support to receive your fail-safe password.



Head information screen

The head information screen is the main navigation panel through this screen you will be able to navigate into the submenu, of the monitoring system.



Device Name: displays the name of the device. Individually can be changed

Total Uptime: Displays the elapsed time from the last boot of the device

IP address: Displays the IP(Internet Protocol) address of the device which must be a unique identifier in the network.

Managed head: displays the managed head type.

Head Serial Number: This is the head serial number and during the Activation process we will ask for this number.

Status info screen

Clicking on the Device Setup you will enter the main status information screen, which will give you good summarized information of the device, such as status information of the transmitters, detector level, or temperature values.

Status Information				
Transmitter(s) signals:			Interface status:	
Laser ON:	error		TP_Link:	100M, Full
			FO_Link:	No Link
			Remote is visible:	error
FAN:	ok,ok		Remote TP Link:	NA
Analog values:			Power supply:	
Temperature:	ok	23 °C	PSU:	ok
Detector level:	error	0.44 V	0 unit	Receiver status:
Remote Detector level:		0.00 V	0 unit	Rx OK:
			error	

Laser ON: Transmitter transmits

Temperature: ambient temperature inside the device. These units were designed for extreme conditions and should not have any problems under -20C to 70C. In fact the unit is emitting some heat so the temperature displayed is not the air temperature outside the head. For example the temperature can be -10C outside but in the device it won't go below -1 or -2. The value will display error depending on the setting was done device setup. There is no default value for this setting, only a suggested value, which is 60C.

Detector level: shows the local heads received level. In volts, the maximum is 7 volts and the minimum is 0.2 volts. The value will display error depending on the setting was done device setup.

Remote Detector level: this value is displayed from reception of the remote head. The maximum is 7 volts and the minimum is 0.2 volts.

TP_Link: displays that there is connection over the TP cable.

FSO Link: displays that there is valid signal received from the remote end.

Remote is visible: this status information is a good information about the connection over the two laserheads if this status is OK that means that there is data transferred over the link.

Remote TP Link: shows that whether the remote end is connected into the switch and the TP interface is available.

PSU: The PSU of the device is sending the OK signal.

RX OK: this information is showing that the receiver is enabled. It basically means that there is valid signal with necessary strength is received in the local end.

Device setup

The device setup screen leads you to the main monitoring options. Here the alarms can be set and main information about the Laser head.

BitView Web

Device Information	
Device name: FSO HEAD 1	Change
Managed head: GigaPico+ TP (3)	
Temperature alert level: 70 °C	Change
Auto-Recovery Time (0=disabled): 1 min	Change
Motherboard Serial number: 537690	
Head Serial number: 0000001	
Software version: 3.2.1236 / 098C	(factory)
Uploaded software: none	Update
Remote software: NA	
NPASW SW version: 0.256	Update
GBIC-compatibility mode: off	Change

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Device name: unique identifier of the device

Managed head: Type of the laserhead

Temperature alert level: when the temperature reach this value, the alarm will be triggered.

Auto recovery time: It determines the time before the heads start the recovery process in the case of link disconnection.

Motherboard Serial number: Mainboard serial number inside the head (Not the same as the Head Serial Number)

Motherboard Firmware version: This is the version number of the Firmware For the update procedure please referr to the Firmware update section.

Head Serial number: Serial number of the unit. Should be the same number as the one on the back of the unit. If the number is missing or not match up with the one on the back, during activation this is the number you will have to let the support know.



LB-WEB
set value:
[Set](#)
[Close](#)

Software version: software of the laser head.

NPASW SW version: Network Port Auto SWitchover version.

GBIC-compatibility mode: On or OFF.

If there are two connectors under the laser head then the GBIC-compatibility mode should be ON (there is GBIC-module in it) but if there are 3 or 4 then the GBIC-compatibility mode should be OFF (there is NPASW module in it).

Network Setup

Clicking on the IP Setup link you can have access to the Ethernet module of the system, this will make easy access to the IP number and/or port settings. These settings are sensitive settings and some of them cannot be restored by the user. Please always do the changes with extra care! If you have doubt in any step, do not hesitate to contact the technical support of the manufacturer website for further information.

BitView Web : GigaPico+ TP

Network Setup	
IP address: 192.168.100.221	Change
Subnet mask: 255.255.255.0	Change
Default gateway: 192.168.100.1	Change
Mac address: 00-50-C2-19-3C-5E	
Auto MDI/MDI-X: enabled	Change
Auto-Discovery: enabled	Change
Auto-Discovery UDP port: 2690	Change
Remote IP address: 192.168.100.220	Change SWAP
NPASW (Network Port Auto-Switchover) mode: FSO	Change
Actual NPASW port: FSO	
NPASW time limit: 1 seconds	Change
NPASW threshold LOW: 0.50 V	Change
NPASW threshold HIGH: 1.00 V	Change
Status summary	
Detector level: 0.03 V	
Remote Detector level: 0.00 V	
Remote is visible: error	

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Local IP: the IP address of the local device can be set in this box. If the IP address is set retype it to your browser.

Enter only valid IP addresses, if you forget the IP address, you will have to turn to our support and in some cases return the device for resetting the IP address. Please always do the IP change with care.

192.168.100.220
set value:

Subnet mask: you can set the subnet mask of the local device.

Default gateway: The default gateway setting for the local device.

Auto MDI/MDI-X: this enables the Auto setting for the MDI/MDI-X, some old switch types might report incompatibility here it can be switched off. (Auto MDI/MDI-X can be turned off even in the Xs systems)

Remote IP: This will tell this device what the IP address of the remote device is. This setting won't change the remote unit's IP address, this just identifies the remote device for the local device. If the IP address is not valid all displays will go error and the display of the remote site's received level on the laserhead will be disabled!

SWAP: swaps the local and the remote IP address. This function will require a swap on the remote end to make the entire system working. If this function is used restart the system.

NPASW mode: Network Port Auto Switchover

FSO: Transmission through FSO.

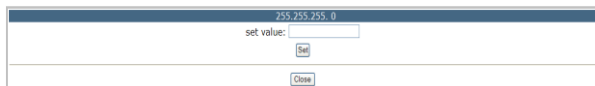
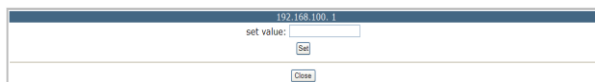
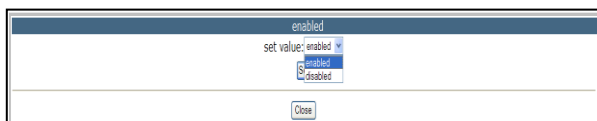
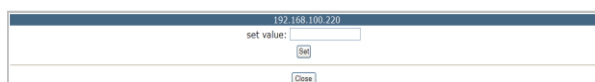
Backup: Backup channel (FSO disabled)

Auto: If NPASW mode is Auto then the actual channel chosen by the software is ON. (FSO or backup)

NPASW time limit: Minimum time needed to switch from backup to FSO (minimum 2 seconds)

NPASW threshold LOW: switches to backup

NPASW threshold HIGH: switches to FSO

SNMP Setup

One of the main features of the device is the SNMP(Simple Network Monitoring Protocol). The SNMP settings can be set on this page.

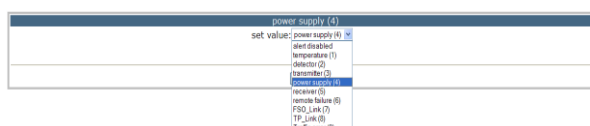
BitView Web - Pinto-X		
Snmp information		
Trap address: 0. 0. 0. 0		Change
1. trap event: power supply (4)		Change
2. trap event: alert disabled		Change
3. trap event: alert disabled		Change
Read community: public		Change
Read-write community: public		Change
Agent UDP Port: 161		Change
Trap UDP Port: 162		Change

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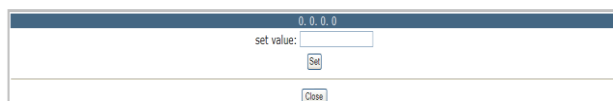
Trap address: The IP address of the SNMP trap over the network.

Trap events in the system you have possibility to setup three different trap event.

For further details on the trap event see Trap event list chapter of this book. In this section there are the settings of the SNMP Agent.



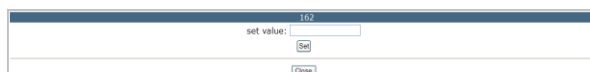
SNMP trap address: IP address of the SNMP tarp computer



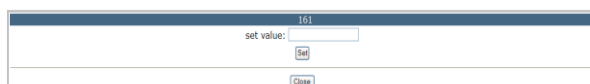
Read Community and Read Write community To the setup of the Read and the Read-Write community, the preset value is public



Agent UDP Port the SNMP agent UDP port number (1...1000) the preset value is 162



Trap UDP Port: the SNMP trap UDP port number (1...1000) the preset value is 161



Traps:

The Laserhead is sending two different traps:

LaserHeadAlarm (OID: 1.3.6.1.4.1.17857.0.1201) This trap will be sent after any of the alarms will go on (for alarm setting please see chapter 5.4)

LaserHeadAlarmCancel (OID: 1.3.6.1.4.1.17857.0.1202) After the alarm goes off this trap will be sent

Security

On the security section you can set the username and the password for the unit. If you have forget the usernam and/or the password please contact The technical support.

Security Setup	
Username: admin	Change
Password: *****	Change
MGM Trusted-host filtering: off Change	
Trusted IP address: 0. 0. 0. 0	Change
Trusted MAC address: 00-00-00-00-00-00	Change

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MGM Trusted-host filtering: Here you can adjust two addresses wehre you can till in from which computer with you reach the MGM! To adjust you will hove to adjust a filter.

Filter adjust:

Off: Turned off.

IP: Only see the IP address.

MAC: Only see the MAC address

IP+MAC: Either IP or MAC address should be equal to the adjusted.

IP&MAC: Both IP and MAC addresses should be equal to the adjusted.

Auto-focus setup (AF)

Automatic divergence corrections:

Enabled (auto): adjust beam size to the best level according to the remote level.

Disabled (manual): It disables the automatic adjustment routine, and lets the user adjust the beam size by using the „STEP” buttons.

BitView Web : GigaPico+ AF

Auto-Focus system	
Automatic divergence corrections: disabled	Change
Last activity: disabled	
Current position: 250	Save position as default
Default position: 250	Move to default position
Remote is visible: ok	
Remote Detector level: 6.56 V Optimal	
Manual-Focus control	
-200 STEP	-50 STEP
-25 STEP	-1 STEP
STEP +1	STEP +25
STEP +50	STEP +200

Last activity: which the AF (auto focus) has done.

idle: AF was not active..

setting default: saves the standard settings.

moving default: return to default settings.

moving to open: opens to widest beam.

increasing remote load: the AF adjusts the laser beam to increase remote level.
decreasing remote load: the AF adjusts the laser beam to decrease remote level.
optimizing remote load: the AF adjusts the laser beam to optimal remote level.

Manual focus control: After setting the Manual Focus controls you can adjust the manual focus by clicking on the „STEP” buttons. You can increase the beam size, by clicking on the plus numbers or you can decrease it by clicking on the minus. The amount of the increase or the decrease depends on the number of steps .

Mandatory Management Activation

Thank you for buying our product. Please read this note carefully. From software version (3.2.1218/R090x)!

The product you have bought has fully functional management software, which has limitation only in time. The unit activation request should be sent to activation@geodesy-fso.com. And the activation code will be issued, later and sent to the email address give, or can be accessed from your local distributor.

After 90 days if the system was not activated the data transmission will be degraded!

Activation process:

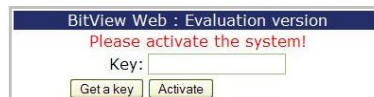
1. Login to the devices through a web browser using the IP:192.168.100.220,192.168.100.221
2. Default login name:admin and password:admin

3. Click on Evaluation period

BitView Web

Evaluation period (240 hours remaining)

4. Click on Get a key



BitView Web : Evaluation version
Please activate the system!
Key:
Get a key Activate

5. Fill in the table and click on send



FSO HEAD 3: Evaluation window - Netscape - Navigator
File Edit View History Bookmarks Tools Help
http://192.168.100.221/evalform.htm
FSO HEAD 3: Evaluation window
BitView Web : Evaluation form
Name:
Company:
Email:
Send
Back to Main page

6. We will return the activation key

Limitations:

- All Next-Series(100MB/s) limitation course 1-60 days unlimited, for 61-80 days 10MB/s, for 81-90 days 1MB/s, beyond 90 days 100KB/s (MGM-Option).
- All GigaNext-Series(1000 MB/s) will be limited after the 90th day, when the whole bandwidth will be blocked, except the management system.

Firmware update

BitView Web

Device Information	
Device name: FSO HEAD 1	Change
Managed head: GigaPico+ TP (3)	
Temperature alert level: 70 °C	Change
Auto-Recovery Time (0=disabled): 1 min	Change
Motherboard Serial number: 537690	
Head Serial number: 0000001	
Software version: 3.2.1236 / 098C	(factory)
Uploaded software: none	Update
Remote software: NA	
NPASW SW version: 0.256	Update
GBIC-compatibility mode: off	Change

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The firmware update has the following steps:

Run FTP client
 Log-in to the Laser-head
 Copy Geodesy_FWUpdate_Vxx.sys over
 Log in the laserhead
 Click on update
 Wait 50-60 seconds
 Restart the laserhead

Run FTP client
 FTP client setup
 IP address: the IP address of the device (192.168.100.220 or 192.168.100.221 as a factory default) or the IP address you gave to the system earlier – same as the IP address for the Web management.

User name: same as for the web management (default admin)
 Password: same as for the web management (default admin)

If you have passive mode please turn it off, otherwise the system will not connect.

[-0-] ftp://192.168.100.221			
0:*.*			
Név	Kit.	Méret	↓Dátum
[..]		<DIR>	1980.00.01
core	sys	4 096	2008.04.01

copy the file over to the Laserhead

0:*.*			
Név	Kit.	Méret	↓Dátum
[..]		<DIR>	1980.00.01
update	xbn	?	2008.06.01
core	sys	4 096	2008.04.01

Log off the FTP server

Now the Update button will be active

Device Information	
Device name: FSO HEAD 1	Change
Managed head: Pico-X (1)	
Detector alert level: 0.50 V	Change
Temperature alert level: 70 °C	Change
Auto MDI/MDI-X: enabled	Change
NPASD: disabled	Change
Motherboard Serial number: 228855	
Head Serial number: 0000001	
Software version: 3.2.1204 / 084C	(factory)
Uploaded software: 3.2.1206 / 086C (U)	Update

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Click on update and the update process will start it takes upto 60 seconds. The LEDs on the back of the device will go off than lit one after the other.

Make sure that the system power is fixed and the power will not go off during the update process. If the LEDs froze, wait 2-3 minutes before unplugging the power cable, and replugging again.

7.2 Network Interface software update

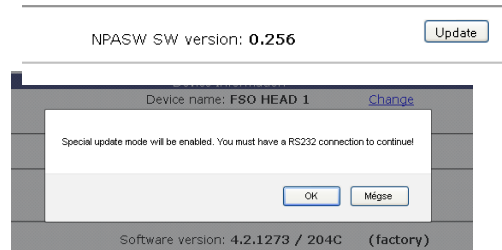
1. Connect the RJ11 and RS232 cable (update cabel) between the laser head and the PC.



2. Enter into the management of the laser head and into the device info.

4. Click on the „Update” button.

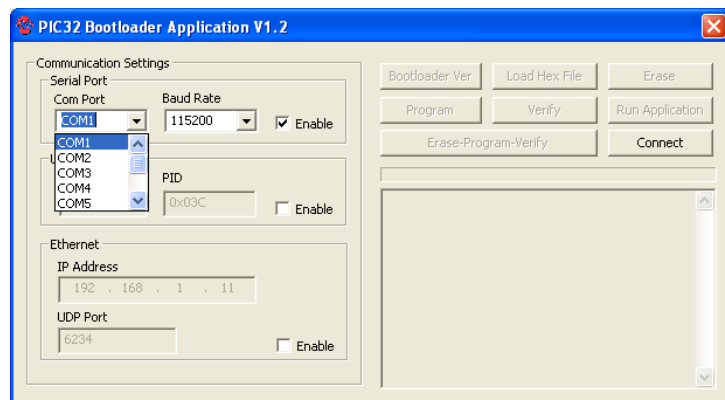
5. Click on OK button.



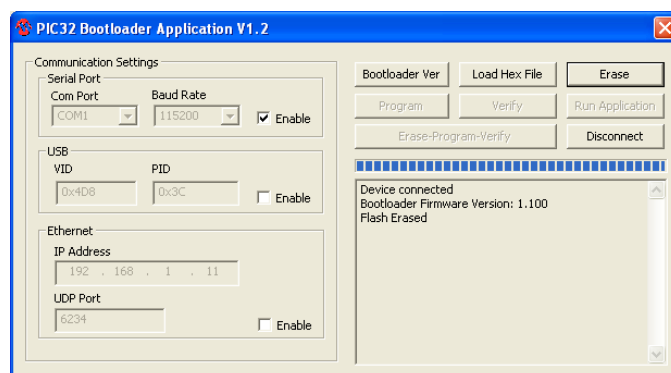
6. Start the Total Commander program and start PIC32.exe program.

7. Choose COM1 port.

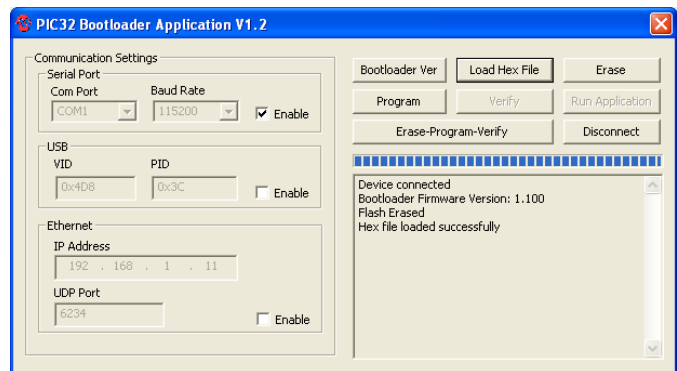
8. Click on the Connect button.



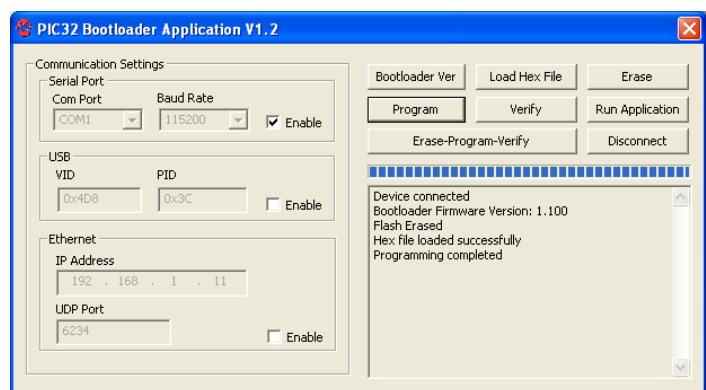
9. Click on Erase button.



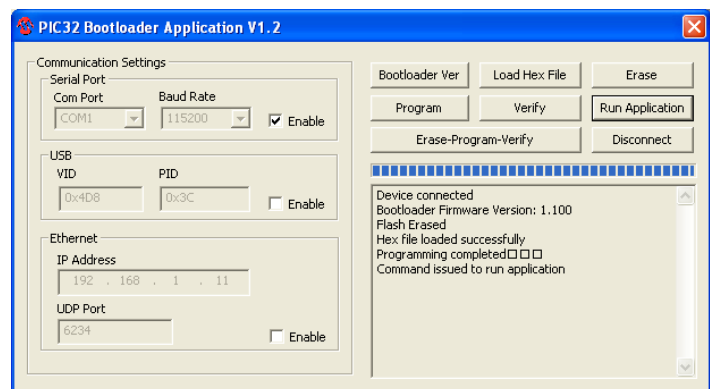
10. Click on Load Hex File button and then choose the attached .HEX file (new software)



11. Click on the Program button.



12. Click on Run application button: the laser head will restart with the new software.



13. Click on the Disconnect button and close the program.

7.2.1 Update cabel

RJ11 and RS232 connection table

